

**The Political Economy of Redistribution
in a Federal System**

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1 Introduction.

This paper explores the effects of centralized and decentralized redistribution on the efficiency of the allocation of resources.

This question has become increasingly relevant as the debate on fiscal federalism has picked up momentum in a number of contexts. In the U.S., the "new federalism" doctrine calls for shifting the financial responsibility of many redistributive programs from the federal government to the state and local governments. In Europe, the process of integration will soon have to address the question of which fiscal policy arrangement should be adopted, and distributive programs will inevitably be at the forefront of the debate. Indeed, the Maastricht treaty already envisions a substantial harmonization of social security standards among European countries. Moreover, the recent Danish vote has shown that worries on the fate of social security in a federal system can be at the core of the process of integration.

Finally, policy-makers in many countries with a serious budget deficit problem know very well that the political interests vested in the redistributive programs can make their reform virtually impossible. In many circumstances, these programs are essentially used by incumbent politicians to create or perpetuate political consensus around them. To the extent that politicians do not internalize the full effects of this type of expenditure on the central budget, this political use of redistributive programs is undoubtedly a major source of deficit bias. It is intuitive that a decentralized redistribution, whereby politicians must rely on the resources of their constituencies to fund redistributive programs, might lead to lower levels of expenditure.

For all these reasons, it seems relevant to ask whether decentralized or centralized income redistribution provide the policymakers with more incentives to expand the social security system. The next step is then to understand how an increase in redistributive expenditure might affect the allocation of resources in a federal system. In this paper, we focus on two channels. On the expenditure side, social security alters the alternative income of unemployed workers and therefore the supply of labor. This effect is obviously magnified in the presence of labor unions. On the revenue side, the taxes needed to

finance redistributive expenditures alter the after-tax returns to the mobile factors and therefore their allocation. The question we analyze is whether a particular fiscal policy arrangement might allow some sectors of the economy to use the fiscal system to their advantage and, in so doing, impose an inefficient allocation of resources.

The conclusions of this paper depart substantially from the existing literature on the topic. The traditional view is that income redistribution in a federal system should be undertaken by the central government. If the welfare of the poor is a national, as opposed to local, concern, then the assistance to the poor has a dimension of a public good with the usual problems of underprovision if its supply is decentralized. But even if the rich in each locality care about the welfare of the poor in the same locality only, there might be a strong argument in favor of centralized redistribution because of the mobility of welfare recipients. If local governments were to take responsibility for redistribution, they would try to export the costs of redistribution by setting lower taxes and transfers than their neighboring local governments, thereby inducing outmigration of the poor and immigration of the rich. But if all local governments follow this strategy, the end result is only a suboptimally low level of redistribution. By contrast, a central government would internalize the externalities arising from the mobility of welfare recipients and would set the degree of redistribution at its "optimal" level.¹

The central thesis of this paper is that decentralized income redistribution might have been dismissed too early. The discussion above has already highlighted three important aspects that have been overlooked by the existing literature: (i) the effects of redistribution on economic activity,² in particular in the presence of strong labor unions; (ii) the effects of taxation on the allocation of capital; (iii) the incentives to use the social security system for political purposes.

Once these elements are incorporated in the analysis, they can tip the balance in favor of decentralized redistribution. In summary, the argument runs as follows. An

¹Strictly speaking, these are arguments for common benefit standards, not necessarily for centralized *financing* of the programs. Of course, if the proportion of the poor or the fiscal capacity vary markedly from state to state, then there might be a reason for centralized funding as well.

²Using a different type of model, Johnson (1988) and (1990) analyze the impact of redistributive policies at the local and central level on labor supply. However, the focus there is completely different from the question analyzed in this paper.

expansion of redistributive expenditures can reduce labor supply through its effects on the availability of alternative sources of income. It can also cause an outflow of capital through two distinct channels: as employment decreases, the return to capital decreases for a given tax rate on capital; in addition, as the tax rate increases in order to finance the expansion in the program, the after-tax return to capital decreases for a given employment. A centralized fiscal policy might allow a region to draw tax revenues from other regions. This might provide the resources for an expansion of their redistributive programs, with their distortionary effects. By contrast, in a decentralized fiscal system each region has to rely on its own resources to finance its redistributive programs. This increases their economic and political costs, or simply sets a binding constraint on the availability of fiscal revenues. For all these reasons, a decentralized fiscal policy can be more effective in checking the expansion of distortionary programs.

The paper is organized as follows. The next section describes the model and then formalizes it. Section 3 explores the relative effects of centralized and decentralized fiscal policy on unemployment when capital is immobile. Section 4 does the same for the case of capital mobility. Both Sections 3 and 4 provide an intuitive discussion of the results together with their formal derivation. Section 5 compares the effects of centralized fiscal policy when capital is immobile and mobile respectively. Section 6 concludes by discussing the results and some of their policy implications.

2 The model.

2.1 The structure of the economy.

Since initially we want to focus on the role of labor markets, we consider two regions, A and B, which are identical in all respects except in the characteristics of their labor markets. In region A, all the labor force is organized in a monopolist union that sets the wage taking the demand for labor as given. In region B the labor market is perfectly competitive.

Technology is identical in the two regions: each can produce one traded good with

a Cobb-Douglas production function in two factors, labor (L) and capital (K): $y = L^\alpha K^{1-\alpha}$. Both regions are small, so that the price p of the good is given.³ As a normalization, assume that $p = 1$.

Factor endowments are also identical. The labor force has size \bar{L} and the endowment of capital is \bar{K} in both regions. Labor is immobile, while capital can be immobile or mobile across the two regions. We will compare the outcomes of centralized and decentralized fiscal policies under the two assumptions about capital mobility.

Finally, in both regions there is a measure L_p of retired agents ("pensioners") whose only source of income is a social security benefit.

2.2 The structure of fiscal policy.

Fiscal policy consists of two redistributive programs that provide a social security benefit s to pensioners and an unemployment benefit b to unemployed workers. The size of both benefits is fixed exogenously.⁴ Fiscal policy, i.e. tax revenues, determines how many benefits can be financed and distributed. Total tax revenues must be allocated to pay for pensions, and then the residual can be used to pay for unemployment benefits. In what follows, we will assume that the pension s and the unemployment benefit b are the same. This assumption is made exclusively for analytical convenience, and absolutely nothing substantial depends on it.

Taxation of capital is the source of revenues used to finance the social security programs: throughout the paper, the government budget is assumed to be balanced. Capital is taxed at a fixed rate t per unit of capital. There are convex costs in redistributing taxes, so that if t is the tax rate, only $(t - \gamma t^2)K$ can be redistributed. This ensures that

³Note that, since the number of factors exceeds the number of goods, the factor price equalization theorem does not apply. However, since the two regions have identical technologies and factor endowments, if there were no differences in the structure of the labor market and/or fiscal policy, the wage and the return to capital would be the same in the two regions.

⁴This assumption is made both for analytical convenience and because it seems realistic. Virtually all entitlement programs fix the benefit, and the actual expenditure is determined endogenously by the behavior of the agency that administers the program. In addition, as we mentioned in the introduction, the existing literature has convincingly made the case for uniform benefit levels in a federal system. Finally, this assumption may be particularly relevant to analyze fiscal policy in the context of European integration, since harmonization of social security standards is an important (and controversial) provision of the Maastricht treaty.

the tax rate that will be enacted will not exceed $\frac{1}{2\gamma}$. Also, tax revenues in each region cannot exceed $\frac{1}{4\gamma}K$, where K is the equilibrium level of capital, which can be different from \bar{K} if capital is mobile.

Fiscal policy can be centralized or decentralized. In the former case the tax rate is common to both regions, and revenues are shared to finance all the subsidies granted in the two regions. In the latter case each region chooses its own tax rate taking the tax rate of the other region as given, and subsidies in each region are financed using the revenues raised in that region only.

2.3 The structure of the political process.

When the union sets the wage it takes the tax rate as given. The tax rate is then determined endogenously through majority voting. There are three types of actors in the political process: holders of capital, workers and pensioners. We assume that each of the three classes of agents has by itself less than 50% of the total votes. Each individual's proposed tax rate is the one that maximizes his utility, taking into account that the wage and therefore employment will be set by the union according to the process described above.

Utility is linear in expected income. In addition, we assume that pensioners care about the utility of workers. This is a realistic assumption, and a common one in many dynamic models with overlapping generations. However, none of the results of the paper, in particular its propositions, will depend on this assumption. The same results could be obtained by assuming that workers care about pensioners too, or that neither type of agents cares about the welfare of the other type of agents. The only function of this assumption is to shorten the analysis of the voting equilibrium and it makes it slightly more intuitive.

Often, the situation will arise when an agent will be indifferent between a given tax rate and all tax rates above it. We assume that in this situation an individual will vote for the lowest tax rate in the interval where he is indifferent. Again, nothing substantial hinges on this assumption.

As a matter of realism, we could assume that the pension s *must* be provided to all pensioners whenever the fiscal capacity of a region is sufficient to generate enough tax revenues. In other words, we could assume that the tax rate being voted on has to exceed the level that raises enough revenues to provide a pension to all retirees. Again, all the results of this paper go through whether one makes this assumption or not. Only for expositional simplicity we will not restrict the tax rate.

2.4 The formal model.

The model described in the previous subsection can be formalized in the following way. In region A, the union chooses employment L to maximize the expected income of its members taking the tax rate as given and subject to a series of constraints representing labor demand and fiscal policy constraints. Therefore, the problem of the union in region A is:⁵

$$Max_L \quad wL + I \quad (1)$$

s.t.

$$w = \alpha L^{\alpha-1} K(t, L)^{1-\alpha} \quad (2)$$

$$\begin{aligned} I &= s(\bar{L} - L) \quad \text{if } L \geq \tilde{L}, \\ I &= s(\bar{L} - \tilde{L}) \quad \text{if } L < \tilde{L} \end{aligned} \quad (3)$$

$$\begin{aligned} \tilde{L} &\text{ s.t. } (t - \gamma t^2)K(t, \tilde{L}) = s(L_p + \bar{L} - \tilde{L}) \quad \text{if } (t - \gamma t^2)K(t, \tilde{L}) > sL_p \\ \tilde{L} &= \bar{L} \quad \text{if } (t - \gamma t^2)K(t, \bar{L}) \leq sL_p \end{aligned} \quad (4)$$

or

$$\begin{aligned} \tilde{L} &\text{ s.t. } (t - \gamma t^2)2\bar{K} = s(2L_p + 2\bar{L} - \tilde{L} - \tilde{L}_B) \quad \text{if } (t - \gamma t^2)2\bar{K} > s2L_p \\ \tilde{L} &= \bar{L} \quad \text{if } (t - \gamma t^2)2\bar{K} \leq s2L_p \end{aligned} \quad (5)$$

⁵Throughout the paper, all variables refer to region A unless otherwise indicated.

(1) is the expression for the expected income of a union member. Employed workers get the wage w , which is a function of employment L through the labor demand function (2). Unemployed workers get the unemployment subsidy s after pensioners are given a pension. This is captured by the function I that appears in expression (1) and is specified in (3). The cut-off level of employment \tilde{L} that appears in (3) is defined implicitly in (4) and (5) as that level of employment such that tax revenues are enough to pay the benefit s for the L_p pensioners and exactly $\bar{L} - \tilde{L}$ unemployed workers for any given t . Thus, $\bar{L} - \tilde{L}$ is the maximum level of unemployment that can be financed with the existing tax revenues.

Equations (4) refer to the case of decentralized fiscal policy. Here the tax base is K , which is a function of t and L if capital is mobile and is identically equal to \bar{K} if capital is immobile. The interpretation of equations (4) is the following. The first line refers to the case where, at the given tax rate, tax revenues are more than enough to pay the pension s to the L_p pensioners. Therefore, tax revenues in excess of sL_p can be used to finance the unemployment benefit of up to $\bar{L} - \tilde{L}$ workers that the union might decide to leave unemployed. The second line refers to the case where total tax revenues at the given t are not sufficient to pay a pension to L_p pensioners when the capital stock is maximum, i.e. at $L = \bar{L}$. *A fortiori*, then, tax revenues will be insufficient to finance a pension to all L_p retirees when the capital stock is lower, i.e. when there is some unemployment. This means that at the existing tax rate no unemployment benefit can be paid out to unemployed workers: the maximum level of unemployment that can be subsidized by tax revenues is 0, i.e. $\tilde{L} = \bar{L}$.

The definition of \tilde{L} when fiscal policy is centralized is given in equations (5), and is similar the case of decentralized fiscal policy. The tax base is now $2\bar{K}$, regardless of whether capital is mobile or immobile, since the tax rate is common to both regions and revenues are shared. The interpretation of the first line is that total tax revenues are used first to pay a pension to the L_p pensioners in both regions, and then to subsidize unemployed workers in A and B, until revenues are exhausted when $\bar{L} - \tilde{L}$ workers are unemployed in A and $\bar{L} - \tilde{L}_B$ obtain the unemployment subsidy in B. The second line says that, if tax revenues are not sufficient to cover a pension for all pensioners in

the two regions, then *a fortiori* no unemployed worker can receive an unemployment subsidy. Consequently, the maximum level of unemployment that can be subsidized by tax revenues is again 0, i.e. $\tilde{L} = \bar{L}$.

Thus, $\tilde{L}(t)$ that appears in (3) can be interpreted as the level of employment "constrained" by the availability of the alternative income s for the unemployed agents, i.e. constrained by the tax rate t .⁶ Essentially, $\tilde{L}(t)$ is such that $\bar{L} - \tilde{L}(t)$ is the maximum number of unemployed agents that *can* receive a subsidy given that the tax rate is t and the budget is balanced. We will often refer to $\min_t \tilde{L}(t)$ as the level of employment constrained by fiscal policy. Should the union decide to have, say, $L' < \tilde{L}$ employed workers, $\tilde{L} - L'$ of the unemployed workers will not receive any unemployment benefit. For future reference, it will be useful to define the "unconstrained" level of employment, \hat{L} , as that level of employment that the union would choose if the benefit s were available to all its unemployed members automatically. Thus, \hat{L} is obtained by maximizing $wL + s(\bar{L} - L)$ subject only to the expression for the demand for labor, (2). It is obvious that the analysis of this paper is meaningful only if $\hat{L} < \bar{L}$, i.e. if s is sufficiently large so that the union would choose to have positive unemployment if the subsidy was available to all unemployed workers.

In region B, the level of employment is determined by the condition that $w(L) = s$ if $L > \tilde{L}_B$ and $L = \tilde{L}_B$ if $w(\tilde{L}_B) < s$, where \tilde{L}_B is defined analogously to (5).

From now on, we will assume that $w(\bar{L}, \bar{K}) > s$. Thus, in region B all workers will strictly prefer to work rather than claim the unemployment benefit. As a result, as long as capital does not decrease all \bar{L} workers will be employed in B. In A, however, some unemployment may be *ex ante* optimal for unionized workers even if $w(\bar{L}, \bar{K}) > s$.

⁶Under decentralized fiscal policy, the tax base K can also vary. \tilde{L} is therefore constrained by t and K .

2.5 Unemployment and efficiency.

It is important to note that in region A GDP is decreasing in the number of workers that obtain the subsidy s . Indeed, in this model

$$GDP = L^\alpha K^{1-\alpha} \quad (6)$$

and therefore

$$\frac{\partial GDP}{\partial L} = \alpha L^{\alpha-1} K^{1-\alpha} + (1-\alpha) L^\alpha K^{-\alpha} \frac{\partial K}{\partial L} \quad (7)$$

The first term in the r.h.s. of eq. (6) is equal to the wage w , while the second term is zero when capital is immobile and positive when capital is mobile. Thus, $\frac{\partial GDP}{\partial L}$ is always positive. Of course, when capital is mobile and employment decreases in A, GDP increases in B because capital flows to B while employment remains constant at \bar{L} . However, the increase in B's GDP is always less than the decrease in A's GDP . This is obvious if we start from an initial position of full employment and no distortions in both regions, but can be easily proved to be true even if employment in A decreases from an initial level of less than full employment.

However, one has to be clear about what this negative relation between GDP and unemployment tells us. In this model, unemployment is voluntary, at least in an *ex ante* sense. Therefore, it might seem that there is nothing "bad" in having more unemployment. Moreover, since the equilibrium is the result of a voting process, it is necessarily (constrained) Pareto optimal, in the sense that it corresponds to the preferred outcome of at least one group of agents. All we can state is therefore that a frequently used measure of economic well-being, GDP , is negatively correlated to the rate of unemployment. A stronger version of this statement is that, if non-distortionary ways to redistribute income were available, everybody could be made better off by a reduction in unemployment.

3 Fiscal policies with immobile capital.

In this section, we characterize the outcome of centralized and decentralized redistributive fiscal policies when capital is immobile. Since full employment always prevails in B,

from now on we will concentrate on the equilibrium in region A. In solving the model, we proceed in two steps. We first characterize the unconstrained level of employment, i.e. the level of employment the union would choose if the subsidy were available to all its unemployed members. We denote the unconstrained levels of employment as $\hat{L}^{ci,c}$ and $\hat{L}^{ci,d}$ respectively, where the superscript "ci" stands for "capital immobility", "c" stands for "centralized" and "d" stands for "decentralized". We then characterize the constrained level of employment, i.e. the employment that is compatible with the maximum possible number of workers being given the subsidy s given the tax rate t . For any given t , we denote the constrained level of employment as $\tilde{L}^{ci,c}(t)$ and $\tilde{L}^{ci,d}(t)$ for the case of centralized and decentralized fiscal policies respectively.

We then proceed to determine what is the tax rate and therefore the level of employment chosen through the political process.

3.1 The feasible set of fiscal policies.

When capital is immobile, the unconstrained level of employment is the same under both fiscal policy regimes. The reason is that the unconstrained level of employment depends only on the equilibrium level of capital, not on total tax revenues. Since capital is immobile, the equilibrium stock of capital is identically equal to \bar{K} in each region. Formally, maximization of $wL + s(\bar{L} - L)$ subject to (2) only, with $K(t, L) = \bar{K}$, gives the first order condition:

$$w = \frac{s \sigma^{ci}}{\sigma^{ci} - 1} \quad (8)$$

where $w = \alpha L^{\alpha-1} \bar{K}^{1-\alpha}$ and σ^{ci} is the (negative of the) elasticity of employment to the real wage for a given stock of capital, i.e. $\sigma^{ci} = \frac{1}{1-\alpha}$ with the Cobb-Douglas specification adopted here. Plugging these expressions for w and σ^{ci} into eq. (8), the unconstrained levels of employment $\hat{L}^{ci,d}$ and $\hat{L}^{ci,c}$ are defined implicitly by:

$$\alpha^2 L^{\alpha-1} \bar{K}^{1-\alpha} = s \quad (9)$$

The constrained levels of employment do differ across the fiscal policy regimes, because

the tax revenues available to subsidize unemployed workers in A are different in the two cases. When fiscal policy is decentralized, unemployed workers in A can be subsidized out of tax revenues collected in A only. Therefore, for any given tax rate t , $\tilde{L}^{ci,d}(t)$ is defined implicitly by:

$$(t - \gamma t^2)\bar{K} = s(L_p + \bar{L} - L) \quad (10)$$

To fix ideas, we initially assume that the maximum possible number of unemployed workers that can be sustained in region A when fiscal policy is decentralized is "small": $\min_t \tilde{L}^{ci,d}(t) = \tilde{L}^{ci,d}(t = \frac{1}{2\gamma}) = \bar{L} - \epsilon^7$. The interpretation is that region A can sustain only a small number of unemployed workers when it must rely on its own resources to subsidize them. This assumption allows us to consider an isolated region whose redistributive system is limited by the size of the region and consequently can induce very little distortion in the allocation of resources. This is the most natural and interesting starting point to answer the question we posed at the beginning, namely whether integration can lead to more distortions via the increased redistribution made possible by the enlargement of the fiscal system.⁸

When fiscal policy is centralized all tax revenues collected in B that are not used to place B's pensioners on social security can be spent to place A's unemployed workers on social security. For any given common tax rate t the constrained level of employment $\tilde{L}^{ci,c}(t)$ in A is now defined implicitly by:

$$(t - \gamma t^2)2\bar{K} = s(2L_p + \bar{L} - L) \quad (11)$$

3.2 The political equilibrium.

Consider first the political equilibrium under our starting point, decentralized fiscal policy. The problem we are analyzing is interesting only if the level of employment desired by the union, $\hat{L}^{ci,d}$, is less than full employment. If this were not the case, the solution would

⁷Note that, because capital is immobile, the tax base is constant and therefore the maximum tax revenues is obtained at the tax rate that maximizes $(t - \gamma t^2)$, i.e. $t = \frac{1}{2\gamma}$.

⁸However, while Proposition 1 would be essentially unaffected if this assumption were relaxed, Proposition 2 would become less general, although it would still hold under fairly loose sufficient conditions.

be trivial: workers and the union simply would not be interested in taking advantage of the opportunity of earning a positive unemployment subsidy, and \bar{L} would be the level of employment under both fiscal policy regimes.

Under the assumption that $\hat{L}^{ci,d} < \bar{L}$, and since $\tilde{L}^{ci,d}(t = \frac{1}{2\gamma})$ is close to \bar{L} , we will initially assume that $\tilde{L}^{ci,d}(t = \frac{1}{2\gamma}) > \hat{L}^{ci,d}$. This is clearly the most interesting case: it implies that the union would ask for a higher wage if only the workers that become unemployed could be subsidized through the fiscal system. It is however important to note that the main result of this section, Proposition 1, still holds with a minor modification when $\tilde{L}^{ci,d}(t = \frac{1}{2\gamma})$ is allowed to be both smaller and larger than $\hat{L}^{ci,d}$.⁹ We limit ourselves to the exposition of this case because it brings out more directly the intuition of the mechanisms at work here.

The utility of workers in A is maximized at $t = \frac{1}{2\gamma}$, because this is the tax rate that brings employment as close as possible to the unconstrained level. Pensioners' expected income is constant at s for any tax rate in excess of t_{L_p} , where t_{L_p} is defined as the tax rate that finances exactly L_p pensions: $(t_{L_p} - \gamma t_{L_p}^2)\bar{K} = sL_p$. As long as pensioners attach any positive weight to the utility of workers, pensioners too will therefore vote for $t = \frac{1}{2\gamma}$. Hence, both workers and pensioners in A vote for $t = \frac{1}{2\gamma}$, while obviously capitalists vote for $t = 0$. Therefore, a majority of agents votes for $t = \frac{1}{2\gamma}$, and $\tilde{L}^{ci,d}(t = \frac{1}{2\gamma})$ is the resulting level of employment.

When fiscal policy is centralized, there are two possibilities. If $\hat{L}^{ci,d} > \tilde{L}^{ci,c}(t = \frac{1}{2\gamma})$, both workers and pensioners in A will vote for the tax rate that finances exactly $L_p + \bar{L} - \hat{L}^{ci,c}$ pensions in A. This is defined implicitly by equation (11) with $L = \hat{L}^{ci,c}$. Workers and pensioners in B are indifferent to any tax rate, as long as it is enough to finance the subsidy to the L_p pensioners. Consequently, the equilibrium tax rate will be the one that finances $2L_p + \bar{L} - \hat{L}^{ci,c}$ subsidies, and $\hat{L}^{ci,c}$ is the resulting employment.

If $\hat{L}^{ci,d} < \tilde{L}^{ci,c}(t = \frac{1}{2\gamma})$, again all agents in A will vote for $t = t_{max} = \frac{1}{2\gamma}$, and this is the tax rate that will prevail since a majority of voters in B are indifferent between t_{max} and the (lower) tax rate that finances exactly L_p subsidies. The equilibrium level of

⁹The minor modification is that the inequality of Proposition 1 is now a weak one instead of a strong one.

employment in A is then $\tilde{L}^{ci,c}(t = \frac{1}{2\gamma})$.

Therefore, under centralized fiscal policy, the level of employment resulting from the political equilibrium is $\min \{ \hat{L}^{ci,d}, \tilde{L}^{ci,c}(t = \frac{1}{2\gamma}) \}$. Since both are smaller than $\tilde{L}^{ci,d}(t = \frac{1}{2\gamma})$, the equilibrium level of employment under decentralized fiscal policy, we can state:

Proposition 1:

When capital is immobile across regions, employment in region A is lower under centralized fiscal policy than under decentralized fiscal policy.

3.3 Intuition for the result.

The mechanism operating here is exclusively a fiscal policy effect. The elasticity of labor demand to the wage remains constant across the two regimes, and so does the markup of the wage on the unemployment benefit s . The target level of employment for the union, \hat{L} , is therefore the same in the two regimes. However, a centralized fiscal policy enables workers and pensioners in A to use *all* the tax revenues collected in B (in excess of those needed to subsidize B's L_p pensioners) to subsidize unemployed workers in A. If the tax revenues collected through A's tax system constrained the wage demands of the union under decentralized fiscal system, this possibility of using B's tax revenues will relax a binding constraint and will reduce employment in A.

The key question is then: how is it possible for workers and pensioners in A to gather the political consensus of workers and pensioners in B to what is essentially a transfer of resources from B to A? The answer is that, since capital is immobile, the high tax rate advocated by workers and pensioners in A hits only capital in B, not the wage. As a result, workers and pensioners in B are not opposed to the implicit subsidization of unemployment in A on the part of holders of capital in B.

4 Fiscal policies with capital mobility.

We now consider the outcomes of centralized and decentralized fiscal policies when capital is mobile. The main difference with respect to the case of immobile capital is that now

the marginal returns to capital in A and B must be equalized. Therefore, in equilibrium it must be the case that:¹⁰

$$L^\alpha K^{1-\alpha} - t_A = \bar{L}^\alpha K_B^{1-\alpha} - t_B \quad (12)$$

Hence, with capital mobility there are two reasons for capital to flow from one region to another: (i) tax rates can be different in the two regions and (ii) even if the tax rates are the same, if there is unemployment in A the marginal returns to capital can be equalized only if some capital flows from A to B.

In what follows, we denote the unconstrained level of employment with centralized and decentralized fiscal policy by $\hat{L}^{cm,c}$ and $\hat{L}^{cm,d}$ respectively, where the superscript "cm" stands for "capital mobility" and "c", "d" have the same meaning as before. Similarly, we denote by $\tilde{L}^{cm,c}(t)$ and $\tilde{L}^{cm,d}(t)$ the constrained levels of employment under centralized and decentralized fiscal policy respectively.

4.1 The feasible set of fiscal policies.

Under centralized fiscal policy, $t_A = t_B$ identically and capital flows occur only because of differences in unemployment rates. Therefore, K is a function of t through L only. Indeed, from eq. (12) with $t = t_B$ and $K = 2\bar{K} - K_B$ one obtains:

$$K = \frac{2\bar{K}L}{\bar{L} + L} \quad (13)$$

Consider first the unconstrained level of employment under centralized fiscal policy, $\hat{L}^{cm,c}$. The (negative of the) elasticity of the wage to employment is the inverse of the (negative of the) elasticity of employment to the wage, σ^{cm} . Given the Cobb-Douglas specification of the model, one can write:

$$-\sigma^{cm,c} = \frac{\partial \log L}{\partial \log w} = \frac{1}{\frac{\partial \log w}{\partial \log L}} = \frac{1}{(1-\alpha)\frac{\partial \log(K/L)}{\partial \log L}} = \frac{1}{(1-\alpha)(\frac{\partial \log K}{\partial \log L} - 1)} \quad (14)$$

¹⁰Recall that variables without a subscript refer to region A.

Using (13), after some manipulation one can show that

$$\frac{\partial \log K}{\partial \log L} = \frac{L/K}{(L + \bar{L})/K_B} = \frac{\bar{L}}{\bar{L} + L} \quad (15)$$

It follows that

$$0 < \frac{\partial \log K}{\partial \log L} < 1 \quad (16)$$

Therefore, $\sigma^{cm,c} > \sigma^{ci} = \frac{1}{1-\alpha}$. The unconstrained level of employment is now determined by

$$w = \frac{s \sigma^{cm,c}}{\sigma^{cm,c} - 1} \quad (17)$$

where $\sigma^{cm,c}$ is given by eq. (14). Using (15):

$$w = \alpha K^{1-\alpha} L^{\alpha-1} = \alpha (2\bar{K})^{1-\alpha} (\bar{L} + L)^{\alpha-1} \quad (18)$$

Plugging these expressions into eq. (17), $\hat{L}^{cm,c}$ is now defined implicitly by:

$$\alpha (2\bar{K})^{1-\alpha} (\bar{L} + L)^{\alpha-2} (\bar{L} + \alpha L) = s \quad (19)$$

After some manipulation, it is possible to show that the l.h.s. of (19), evaluated at $L = \hat{L}^{ci,c}$, is greater than s . Since the l.h.s. of (19) is decreasing in L , the value of L that satisfies (19), $\hat{L}^{cm,c}$, must be higher than the value of L that satisfies (9), $\hat{L}^{ci,c}$.

The unconstrained level of employment under decentralized fiscal policy, $\hat{L}^{cm,d}$, is more difficult to determine. When capital is mobile and each region decides on its own tax rate, both reasons for capital mobility are present, namely differences in tax rates and differences in unemployment rates. Therefore, now the unconstrained level of employment depends on the tax rates adopted by the two countries, and in general it is impossible to determine analytically whether $\hat{L}^{cm,d}$ is larger or smaller than $\hat{L}^{cm,c}$.

Fortunately, however, this does not prevent us from characterizing the levels of employment that prevail, in equilibrium, under the two regimes. All we need is the constrained levels of employment, $\tilde{L}^{cm,c}(t)$ and $\tilde{L}^{cm,d}(t)$.

It is easy to show that $\tilde{L}^{cm,c}(t) = \tilde{L}^{ci,c}(t)$. Under both fiscal policy regimes the tax

base is the same, because under centralized fiscal policy capital is taxed at the same rate regardless of where it is located.

As to the unconstrained level of employment under decentralized fiscal policy, $\tilde{L}^{cm,d}(t)$, under our normalization it is equal to $\bar{L} \forall t$. In fact, our starting point was a region whose fiscal system in isolation could sustain a very low rate of unemployment: $\tilde{L}^{ci,d}(t = \frac{1}{2\gamma}) = \bar{L} - \epsilon$. When capital is mobile, it is in the interest of B's workers to attract as much capital as they can from A, since this will increase their wage without obviously affecting employment. Therefore, it is a dominant strategy for workers in B to vote for $t_B = 0$ regardless of the tax rate in A. Given this, in A the lowest level of employment that can be sustained, $\min_t \tilde{L}^{cm,d}(t)$, is the lowest value over t of the solutions for L to:

$$(t - \gamma t^2)K(t, L) = s(L_p + \bar{L} - L) \quad (20)$$

The l.h.s. is strictly less than $\frac{1}{4\gamma}\bar{K}$ since in equilibrium $K \leq \bar{K}$, and $K = \bar{K}$ only for $t = 0, L = \bar{L}$. Therefore, $\min_t \tilde{L}^{cm,d}(t)$ is strictly greater than $\tilde{L}^{ci,d}(t = \frac{1}{2\gamma}) = \bar{L} - \epsilon$. The normalization adopted is exactly that ϵ is small enough so that $\min_t \tilde{L}^{cm,d}(t) = \bar{L}$.

4.2 The political equilibrium.

To analyze the political equilibrium under centralized fiscal policy, it is useful to distinguish two cases. Assume first that $\hat{L}^{cm,c} > \tilde{L}^{cm,c}(t = \frac{1}{2\gamma})$. Workers in A can reach the unconstrained level of employment by voting for the tax rate defined implicitly by:

$$(t - \gamma t^2)2\bar{K} = s(2L_p + \bar{L} - \hat{L}^{cm,c}) \quad (21)$$

At this tax rate, all pensioners in A can obtain the subsidy s . Since they care about the utility of workers, they will vote for the same tax rate as workers do. As to workers in region B, their interest is to generate as much unemployment as possible in region A so that capital will flow from A to B and this, in turn, will increase the wage in B. Therefore, workers in B will vote for the same tax rate as workers in A.¹¹ Pensioners in

¹¹Recall that any tax rate above this will not decrease employment in A.

B will then also vote for the same tax rate. Although for different reasons, all workers and pensioners in the two regions will all agree on a common tax rate, one that brings about the unconstrained level of employment in A.

Now consider what happens when $\hat{L}^{cm,c} < \tilde{L}^{cm,c}(t = \frac{1}{2\gamma})$. Workers in region A will vote for $t = t_{max} = \frac{1}{2\gamma}$, so that the resulting level of employment will be as close as possible to the unconstrained one. Pensioners in region A will also vote for $t = t_{max} = \frac{1}{2\gamma}$ as long as they attach a positive weight to the utility of workers. The optimal strategy for workers in region B is again to push employment as low as possible in region A. Thus, workers in B will vote for $t = t_{max} = \frac{1}{2\gamma}$, and so will pensioners in B who care for the utility of workers. The equilibrium level of employment in region A will then be $\tilde{L}^{cm,c}(t = \frac{1}{2\gamma})$.

The political equilibrium when fiscal policy is decentralized is immediate. Since workers in A cannot obtain any benefit at any tax rate because tax revenues are simply not large enough, they will vote for $t = 0$ so as to avoid any outflow of capital and the resulting decrease in wages. Capitalists too of course vote for $t = 0$. Thus, in region A a majority of agents vote for $t = 0$ and as a result there is no unemployment in region A.

Since both the two possible equilibrium outcomes under centralized fiscal policy, $\hat{L}^{cm,c}$ and $\tilde{L}^{cm,c}(t = \frac{1}{2\gamma})$, are smaller than \bar{L} , we have:

Proposition 2:

When capital is mobile, employment is lower under centralized fiscal policy than under decentralized fiscal policy.

4.3 Intuition for the results.

The mechanism at work here is the effects of an increased tax rate on the stock of capital in region A. When workers in A try to expand the social security system by raising the tax rate, they now face an outflow of capital for two distinct reasons: (i) as unemployment increases, the return to capital decreases in A; (ii) for a given tax rate in the other region, the after-tax return to capital in A is now lower than in the other region. Since the tax rate in a centralized setting is common to both regions, only the first reason for a capital

outflow is present under centralized fiscal policy.

In turn, an outflow of capital is bad for workers for two distinct reasons: (a) it decreases the wage for any given level of employment and (b) in a decentralized system only, it decreases tax revenues available to finance the social security system for unemployed workers. Again, only the first effect of a capital outflow is present when fiscal policy is centralized.

It is now clear that centralized fiscal policy provides a less effective check on the inefficiency of the allocation of resources resulting from the political equilibrium in A than a decentralized fiscal policy setting. It is also important to note that the constraints imposed by fiscal policy are crucial here: if one were to compare the unconstrained levels of employment under capital mobility, in general it will be higher under centralized than under decentralized fiscal policy.

As in the case of immobile capital, it is important to understand why workers and pensioners in region B would not by themselves provide a check on the implicit transfer of resources from region B to region A that occurs in a centralized fiscal policy setting when A's workers and pensioners try to maximize the size of the social security system. The reason is that it is in the interest of B's workers and pensioners to generate as much unemployment as possible in A, so that capital will flow to B and wages there will increase. Under centralized fiscal policy, the way to create unemployment in A is to redistribute as much income as possible from holders of capital to unemployed workers in A by expanding the social security system.

5 An alternative interpretation.

The result that centralized redistribution can generate higher unemployment than decentralized redistribution was driven essentially by differences in the structure of the labor markets in the two regions. The model lends itself to a different interpretation, one that relies on differences in the administration of the social security system.

Indeed, an important distinction must be made between *funding* and *administering*

a program at the local level.¹² Even when the standards are set at the central level and the program is funded through revenue sharing from tax revenues collected at the central level, it is often the case that local government have a certain discretion in the administration of the program. By being more or less generous in accepting applications, a local government has a potentially large leverage on total redistributive expenditures within its boundaries.¹³

This politically motivated use of the social security system for patronage purposes might be an empirically relevant phenomenon in certain political systems where incumbent governments must rely heavily on this type of expenditure to bolster their support. For instance, the average ratio of disability pensions to old-age pensions in Italy is 30%, but it increases to 130% in the South and it peaks at 626% in the Enna province in Sicily. Or, public employees in Italy can retire after 15 years of seniority with a government pension. Effectively, then, when used for patronage purposes a social security system can become a very good substitute for a permanent unemployment benefit, i.e. a pension.

In terms of the model developed so far, the effects of these politically induced use of redistributive programs can be formalized as follows. The structure of the labor market is now the same in both regions: the labor force is organized in a monopoly union that sets the wage taking labor demand as given. What differs across regions is now the administrative standards of social security. In both regions, A and B, pensioners have the right to a pension s . In addition, in A workers who apply can receive, say, an invalidity pension b if tax revenues are sufficient. As in the first version of the model, we make the simplifying but innocuous assumption that $b = s$. The reservation wage is therefore 0 in B and s in A. This means that the union will always set the wage at its full employment level in B, while in A it will take advantage of the positive reservation wage by generating some unemployment.

¹²For our purposes, it is irrelevant whether it is the local government or the local branch of a central government agency that administer the program at the local level.

¹³Once again, the literature is fairly unanimous on this point: local governments should participate in the administration of redistributive programs, particularly means-tested ones, because they possess informational and other administrative advantages over the central government (see for instance Ladd and Doolittle (1982)). As a matter of fact, in the U.S., about 70% of expenditures connected to welfare programs is administered by local governments.

The model that formalizes these ideas looks exactly like the one developed in the preceding sections. The solution of the model is the same under the two interpretations; in particular, both Propositions 1 and 2 still hold under the new interpretation. In addition, the mechanisms behind the results work much the same way in the two versions.

Consider, as usual, the case of immobile capital first. When the social security system is used for political purposes to different degrees in different regions, centralized funding of the system can generate a perverse outcome. Regions with looser administrative standards can "free-ride" on the tax revenues collected in other regions to pursue their generous use of social security benefits for political purposes. Conversely, when the funding of redistributive expenditure is decentralized, local governments can rely only on local sources to fund their social security programs. This automatically constrains the use of social security for political purposes. Because the expansion of the social security system would induce unemployment through its effects on the behavior of the union, a decentralized fiscal policy also limits unemployment.

Suppose now the process of integration between the two regions has increased the mobility of capital across them. Now the fiscal policy setting matters for at least two reasons. First, even when capital is immobile, if a common level of taxation is decided at the central level the region with looser administration of benefits will be able to finance more pensions to unemployed workers by free-riding on the resources drawn from the region with stricter requirements. *Ceteris paribus*, this will tend to increase unemployment in the region with a looser fiscal policy administration. Second, when capital is mobile, setting the tax rate at the centralized level will reduce the marginal cost of increasing the tax rate in every region, since capital will face the same tax rate everywhere and a region will not lose capital to another if the common tax rate is increased. The region with most incentives to set a high common tax rate is the one with looser administrative requirements, because only there can workers take advantage of higher tax revenues. Centralized tax setting therefore increases the incentives to set a high tax rate, and increases unemployment in the regions where tax revenues can be used to subsidize unemployed workers.

6 Discussion of the results.

The model developed in this paper illustrates a simple but fairly general point. Whenever some actors have an incentive to distort the allocation of resources by using the redistributive system to their advantage, centralizing income redistribution might provide more revenues to pursue this strategy. This occurs for two main reasons: (i) in a centralized fiscal policy setting, a region may free-ride on the tax revenues of other regions whose individuals do not have the same incentives to use the redistributive system to their advantage; (ii) when capital is mobile, a centralized fiscal policy setting reduces the cost of increasing the tax rate on capital in a region in order to increase revenues. Since the tax rate is common to all regions, the higher tax rate will not induce an outflow of capital caused by a decrease in the relative after-tax return to capital.

For this story to be relevant, regions must differ substantially in the structures of their labor markets and/or in the structure of their political systems, along the lines described above. Our contention is that this is indeed the case in at least two contexts among those briefly discussed in the Introduction. In Europe, the structures of the labor markets differs widely across countries. Perhaps even more importantly, the political systems and the incentives they provide to use fiscal policy for political purposes seem to vary greatly. The same variability in the attitudes of the political systems to redistributive fiscal policy seems to be present in Italy, as suggested by the figures on the proportion of disability pensions in various regions cited in the preceding section.

If these impressions survive a more rigorous empirical investigation, the message of the model is clear. European policy-makers should probably be less enthusiastic of a common social security system with uniform standards financed through revenue-sharing, and national legislators should consider attributing some financial responsibility for social security programs to regional governments.

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